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Politics of Renewable Energy: State, Market, and Global Power Dynamics

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Abstract

Modern societies increasingly depend on energy to achieve growth, social development, and technological advancement. Renewable energy (RE) provides a key strategy for sustainable development, enabling the transition from fossil-fuel dependency to a clean energy system. Despite its contributions to sustainability and longevity, the politics of RE remain relatively neglected compared with conventional energy. Although RE does not bring new geopolitical or geoeconomic considerations, certain deficiencies exist in its analysis and systematisation. Researchers and policymakers require a systematic understanding of the politics of RE that drives the transition from conventional to renewable energy. Adopting a transdisciplinary approach that integrates International Relations, the social sciences, and engineering, this project seeks to identify the key elements, processes, issues, interactions, and dimensions of RE politics. By addressing the questions of which state, market, and global power dynamics govern the politics of RE, this project lays the groundwork for a comprehensive framework that distinguishes the politics of RE from that of conventional energy. Interdependencies among actors on the state, market, and global levels determine the access, timing, content, and destination of RE policies and investment. At the state level, a variety of regulations, fiscal measures, and financial instruments constitute the principal policies for promoting RE. Market characteristics, corporate actors, and private finance emerge as dominant drivers of RE engagement on the market level. Resource endowments, technology acquisition and transfer, strategic competitiveness, and multilateralism are important determinants of RE dynamics on

the global level. The subsequent pages explore the characteristics and contours of international RE (Orhun Altiparmak, 2022).

Keywords: *Renewable energy politics, energy transition, state-market relations, global power dynamics, renewable energy policy, industrial policy, energy geopolitics, decarbonization governance*

1. Introduction

Access to affordable energy is a precondition for broadly based sustainable development, as established by the 2030 Agenda for Sustainable Development and the Paris Agreement adopted in 2015. During the 2016–2020 period, however, global progress was undermined by energy market volatility, heightened security concerns, and insufficient investment (Orhun Altiparmak, 2022). To understand how differing State and Market capacities affect the quality and stability of the sector, the presentation concentrates on examining the importance of Renewable Energy Policies (REPs). Renewables are gaining more attention as technological advances drive the development of alternative fuels that offset carbon emissions, enhance energy diversity, and reduce dependence on oil from vulnerable regions, thereby strengthening national security (L. Davies, 2018). Even though renewable resources such as wind, water, biomass, and solar are abundant, the Renewable Energy Policy (REP) has become a crucial tool for countries worldwide. Even though economic growth and Renewable energy policies are distinct, they share similarities in the social and economic advancement of every country through State- or Market-centric development.

2. The State and Renewable Energy Policy

Two broader forces determine an implementation process for renewable energy. The first is the global political economy of renewable energy, which encompasses how firms and individuals take collective action to support it. The second is the nature of the implementation process itself, which comprises the actors involved, the activities they undertake, the organisations they form, and the resources they mobilise. Collective action can occur at many levels, including but not limited to: 1) international configurations of states and non-state entities that are engaged in the production, transfer, and deployment of renewable energy; 2) inter-governmental agreements that govern energy resource dependencies within and across borders and therefore shape the portfolios of energy that states seek to identify and/or develop; 3) agencies within states or

territories that specify the standards of energy consumption and at what levels: the actions taken at this level greatly affect which projects are developed, the direction of technological diffusion, and, hence, how renewables are eventually configured into national portfolios; and, 4) discourses surrounding the conceptualization of their energy system, the meanings associated with their energy dependence, the pathways of choice, and the notions of 'security' and 'dependence' – these factors inform the Mandarin word for 'energy' and who's sought by state authorities to identify, develop, monitor, transfer, co-produce, procure, acquire, use, and recycle. Indeed, the spatial arrangements of energy among states have changed considerably in the last ten years, and, during this period, building a 'low carbon' energy system has progressively emerged among both sub-national territories and nation-states as an important 'sustainable development' and 'energy security' objective.

2.1. Regulatory Frameworks and National Energy Strategies

(L. Davies, 2018) Governmental instruments play an important role in building momentum for the commercialisation of renewable energy. The most common instruments include regulatory targets, economic incentives, priority dispatch rules, and institutional frameworks (M. Keppley, 2012). Regulatory targets establish timelines wherein utilities must use stipulated proportions of renewable energy generation, commonly prescribed in renewable energy portfolio standards. Incentives can include measures such as subsidies, tax credits, exemptions, certificates, feed-in tariffs and public investment. Electricity dispatch refers to the control of energy generation and transmission. The institution's frameworks define the authority of each regulatory agency, ministry, and public entity.

2.2. Fiscal Incentives, Subsidies, and Public Investment

Future investment in renewable energy will depend on a wide range of factors. Tax incentives, public investment, and subsidy promotion will do this job for the industry's future. In China and Germany, government support for clean energy has been effective. However, the success of policies hinges on how they are implemented and whether they address soft-cost barriers and environmental factors. Thus, comparing financiers of public investment and assessing the suitability of clean energy subsidies at the country scale is important. Feed-in tariffs, capital grants, and technology development grants are more suitable for promoting investment in utility-scale renewable energy than tax incentives, tax

credits, or loan exemptions. The efficiency and stability of government support also significantly influence investments.

Fiscal incentives, public investment, and subsidies significantly influence renewable energy investment (Mormann, 2012). The structures of key sub-fiscal incentive measures across various countries and their suitability for renewable energy development in China are investigated. The general arrangements and characteristics of government fiscal spending, and the conditions underlying them, are also examined. Furthermore, the configuration of public investment and subsidy schemes in China, and the topics of consideration concerning that configuration, are addressed (Høyrup Christensen, 2015).

2.3. Sovereign Financing and Strategic Sectors

Strongly promoting the deployment of renewables can expose countries to the risk of carbon lock-in; thus, strategic public intervention to accelerate renewable development is adopted. For instance, while heavy investments were made in mainland Chinese PV production, other segments of the sector were developed simultaneously, and the government served as an incubator for the entire value chain, given the country's specific situation and the global environment. Hence, investment in strategic sectors also occurs today in renewable energy. Tracking the corporate sector policy again, strong public policies have been implemented regarding the supply chain, promoting the internalisation of the entire lithium value chain through taxation and incentivising regulations on extraction (Tang, 2013).

3. Market Mechanisms and Industrial Policy

Across the world, countries seek to ensure energy needs while emitting fewer greenhouse gases. A key component of many national efforts to reduce fossil-energy dependence is the construction and expansion of renewable-energy infrastructure. Even as many nations pursue renewable energy expansion through similar subsidies and fiscal incentives, they employ different monitoring, verification, and reporting arrangements. Renewable energy regimes often draw on flexibility markets and electricity delivery auctions, stimulating large investments by numerous private-sector players (Høyrup Christensen, 2015). In addition, supply chains vary, with countries supporting distinct technologies and corporate actors commanding different levels of influence.

State and market remain tightly intertwined in national approaches toward renewable energy. State entities shape the character of commitment and investment by determining sector allocations through direct ownership, oversight of the banking and finance system, and trade and technology regimes. Governments back renewables through financing mechanisms and complementary polices that significantly influence technology development. The availability of venture capital and other financing arrangements for renewable projects directly affects the pace of technological advancement. Individual actors influence the design of fiscal instruments and credit mechanisms critical to renewable investments.

3.1. Market Design: Auctions, Carbon Pricing, and Trade

Renewable electricity auctions have been widely adopted as a mechanism to support the development of renewable energy sources. This approach provides a means of allocating projects to developers at the lowest level of support while safeguarding public budgets. Market-design proposals complement the auction mechanism by establishing price signals for renewable energy. An important requirement for the long-term viability of renewables is well-designed emissions-trading schemes, which can generate price signals for low-carbon technologies. Prices have to be sufficiently high to support not only the development of low-carbon technologies but also spur innovation (Fitch-Roy et al., 2019).

The commitment of authorities and the private sector to low-carbon electricity is also aided by international agreements aimed at curbing climate change. The initiatives being implemented are also bound to have indirect and external socioeconomic impacts on developing nations. Therefore, scrutiny of international standards under the United Nations Framework Convention on Climate Change is indispensable (Di Foggia & Beccarello, 2024). Moreover, for certain countries, the market-based mechanism requires them to enhance their measurement and mitigation capacities. Thus far, most renewable-energy plants have been developed exclusively for local consumption, and exporting electricity is not viable. Trading of electricity with neighbouring countries will only begin when the generation units already at the pre-qualifying stage have been realised (Shrimali et al., 2015).

3.2. Corporate Actors, Consumption Patterns, and Supply Chains

The corporate sector has emerged as a crucial actor shaping renewable energy consumption patterns at the national and global levels. This section delves into the importance of corporate players,

highlighting companies' growing purchases of renewable electricity to meet operational demand, enhance brand value, mitigate climate-related financial risks, respond to consumer pressure, and contribute to sustainability goals. The corporate sector's influence is also evident in the way the political and economic frameworks governing energy supply—referred to here as the business model of a country's energy system—are increasingly oriented toward the consumption patterns of large firms (Outka, 2019).

3.3. Private Sector Innovation and Finance

Private sector innovation and financing play a pivotal role in fostering renewable energy development. Various government policies, such as renewable portfolio standards (RPS) and investment tax credits (ITC), significantly influence project finance and lower the cost of capital for renewable technology (Tang, 2013). However, several factors still hinder private sector uptake and the introduction of innovative technologies. Persistent urban-rural divides plague policies in numerous developing nations, where the availability and feasibility of financing, access to knowledge, and the institutional capacity to introduce innovative technologies differ between urban and rural areas. Delays in implementing public-sector renewable energy investments further weaken the push to roll out private-sector initiatives. Nevertheless, government efforts to mitigate development risk fuel breakthrough technologies, foster industry growth, and identify new business models (Byrne et al., 2018).

Innovative technologies can significantly reduce investment and operating costs in specific segments of renewable energy while also building companies that diversify energy-service ownership and foster coordination among firms offering a range of energy-service options. For emerging electricity markets and supply chains, government financing of public-sector demonstration programs, combined with equity investment in private-sector firms, broadens access to private-sector funding. Financing options do not adequately address the need for profitable mega-TW-scale renewable energy development.

4. Global Power Dynamics and Geopolitics

In the context of resource endowments, resource-poor countries generally become dependent on resource-rich countries. This applies to renewable energy and resources concentrated in specific locations, where access to resources and technology (e.g., materials, equipment and know-how) plays a central role. High-tech nations have the

potential to facilitate access to these resources while maintaining a strong 'bargaining card'. When resources are abundant, technology transfer through licensing agreements broadens access to resources on the premise of dependency. Limited licensing capabilities reflect underdevelopment and constitute a barrier to access. Geopolitical influence can also be strengthened through other market dynamics in the renewables sector. Energy demand inevitably increases even with renewable resources, driving countries to seek access routes that allow bargaining.

China's current dominant position in lithium demand requires multiple actors to cope with supply chain shocks. Pressure to limit the transfer of lithium mineral technology and resources under the influence of the Western geopolitical order has emerged. Geopolitical actors are competing to satisfy access demand. End-user producers of battery-electric vehicles have maintained a strategic competitive edge while expanding their national footholds.

Simultaneously, pursuing climate diplomacy constitutes a means of cooperating with countries outside one's influence, thereby mitigating pressure and avoiding the consequent reinforcement of dependence. The promotion of climate cooperation necessitates high-standard policies and robust target-setting, which can significantly aid in establishing meaningful dialogue not dominated by the West. Climate-active economies with high sourcing yet limited resource-milk routes by major actors favour the adoption of renewable technologies, thereby diminishing the priority of resource access and restricting the potential for competition. Access to energy is, hence, contested and shaped by resource endowments in accordance with specific elemental renewable considerations (Orhun Altiparmak, 2022).

4.1. Resource Endowments, Technology Transfer, and Dependency

Renewable energy resources such as solar radiation, wind, and hydropower are widely available globally, yet their commercial exploitation requires substantial capital and technological investments. In contrast to the fossil fuel sector, where resource location heavily influences production growth, the renewable energy sector's expansion depends more on non-resource-specific factors such as institutional and regulatory frameworks. Nonetheless, the possession of mineral resources essential for renewable energy technologies influences the production, consumption, and trade dynamics of these technologies (Orhun Altiparmak, 2022).

Many countries with minimal or no renewable energy resource endowments have established flourishing renewable energy industries through technology acquisition, reverse engineering, and indigenous innovation capabilities, with various domestic companies occupying the entire value chain (Subtil Lacerda & C. J. M. van den Bergh, 2014). China's renewable energy sector exemplifies this trajectory, highlighting the significance of industry-specific licensing regimes amid diverse licensing alternatives for acquiring advanced foreign technologies.

4.2. Strategic Competitiveness and Decarbonization Diplomacy

The competitiveness of a state's economy is partially linked to access to and the pricing of critical materials and technologies. Therefore, the race to harness renewable energy has led to new forms of energy diplomacy. As states strive to create low-emission energy systems domestically, they also seek to address global warming collectively. Active participation can enhance collaboration in developing renewable energy technologies that can then be deployed further upstream. States are negotiating several solutions to stimulate the development of clean energy technology and minimise the decline of critical fossil fuel sources, including the potential standardisation of trade agreements and the consideration of mitigation measures. Efforts are underway to redesign multilateral financing agreements to promote the transition to a new energy economy while enabling the continued extraction of traditional energy sources (Hoppe, 2011).

Strategies to stimulate the market for clean energy technology and agents engaged in addressing climate change have created demand for collaboration among states. Technical cooperation for renewables has expanded; initially bilateral or limited to the G8, it has now broadened to cover a variety of arrangements and interest groupings. Decarbonization diplomacy, focusing on the interplay between climate change and the energy supply system, has emerged. Countries are signing agreements committing to clear policies, monitoring progress, and reporting to the UN, with the inaugural meeting of the Energy and Climate Partnership of the Americas, convened in 2010, marking the first linkage that occurred at the summit level. Affected nations were invited to join the process.

Increased mobility and reliance on trade have led to interdependence in the clean energy sector. Realism and neorealism, which oppose the possibility of cooperation, have fallen short of accounting for the mutually beneficial, technology-driven interdependence currently being structured. The growing

dominant share of players developing techniques to manage or limit carbon emissions opens the possibility of international cooperation on upstream controls on fossil fuels or the transfer of clean technology (Biber et al., 2017).

4.3. Multilateral Institutions, Agreements, and Compliance

National involvement in global environmental agendas is articulated through multilateral agreements and institutions (Ershadul Karim et al., 2018). Politically, the governing structures of developed countries support acceptance of high-profile commitments, though participation does not ensure fulfilment. Global climate negotiations post-1990 led to the ratification of multiple protocols, the most significant of which was the 2016 Paris Agreement, which codified state obligations and mechanisms for compliance. Compliance is monitored through a global accounting framework that is collectively identified and agreed upon. Countries specify flexible pathways that are inconsistent with the scientific literature on temperature rise and delta indicators, rather than on quantity (Schmitz, 2016). While monitoring provides information for compliance action, countries continue to direct negotiations along familiar pathways.

5. Domestic Politics and Social Impacts

The energy transition can greatly affect domestic social impacts and political dynamics. Renewable energy creates extra local jobs when labour-intensive technologies are deployed, and ownership is distributed among citizens and cooperative companies (Eadson & Foden, 2019). Government-sponsored training programs and regional labour policies can further improve labour-market outcomes without triggering trade-offs (Ratnikova, 2010). Such policies can foster a sense of fairness and equity in the overall energy transition, thereby increasing the political bankability of renewable energy projects (Orhun Altiparmak, 2022).

When public opinion, interest groups, regional disparities, and local governance are considered, the political feasibility of renewable-energy deployment may vary even for technologies that are economically, technically, and environmentally beneficial. Analysing perspectives on each renewable-energy option enables the identification of technologies that not only mitigate problems but also advance broader development objectives.

5.1. Labour Markets, Equity, and Just Transition

Renewable energy deployment can create a wide variety of jobs across different regions, from manufacturing to sales and

services (S. Henry et al., 2020). By promoting rebuilding better, the green recovery approach aims to achieve environmental sustainability while stimulating economic activity. In theory, a shift away from fossil fuel sectors could adversely affect certain regions, but the transition to renewable energy also represents a major economic and energy opportunity. Ensuring a just transition requires addressing the affected communities through appropriate and timely policies.

5.2. Public Opinion, Interest Groups, and Political Bankability

As society faces the pressing need for climate and environmental action, the climate crisis has forged a sense of urgency. Political alignment for renewable energy adoption has been examined, but limited attention has been paid to voters' views and the influence of industry groups on policymakers. Surveys report strong commitment to, and recognition of the benefits of, renewable energy. However, support decreases when costs are high, grid integration challenges arise, or government assistance to stimulate adoption is lacking, consistent with research on energy transition pathways. Political considerations and lobbying further constrain action: industry groups advocate for conventional energy and efficiency, while fossil fuel and electricity-supply interests oppose renewables (Delicado et al., 2014). Media analysis in Germany found a shift from framing support schemes as beneficial to industry to a framing that emphasises costs, thereby limiting public backing (Dehler-Holland et al., 2020).

5.3. Regional Disparities and Local Governance

Governance priorities vary considerably between regions. The adoption of renewables in both rich and developing countries is hindered less by technology and investment than by social and political developments. Locally, the breadth of renewable solutions and the range of stakeholders and governance practices across levels of authority lead to wide variation (Cowell et al., 2017). Coexisting trajectories of policy implementation across political levels give rise to differences in the pace and types of renewable adoption. The capacity and willingness to adopt renewable energy at the local level are influenced by the resources available to local governments. The existence of these co-existing trajectories allows certain locales within a state to experiment with energy solutions and develop experiences and practices that can later be diffused further afield.

6. Governance Challenges and Policy Convergence

Policy divergence also occurs across multiple dimensions of renewable energy systems design. The prominent cross-jurisdictional challenges of supply and operational flexibility are considered core to the integration of renewable energy (Pastukhova & Westphal, 2020). The governance task involves managing the energy transition and its geopolitical implications. It aims to expedite, smooth, and make the transition equitable, recognising disruptive systemic effects on political systems, economies, and societies. Energy transitions occur within a complex geopolitical environment. The struggle for political authority is compounded by technology leadership and control of resources, and global rivalry and crises in multilateralism hinder cooperation on common energy goals. Maintaining existing institutions such as the WTO, IRENA, and UN Energy is crucial, as is plurilateral action through clubs, coalitions, and alliances. Governance structures, including the IAEA, IEA, IRENA, UN Energy, and SE4All, support energy-system transformation across strategic paradigms. Effective system transformation further depends on governance efforts targeting energy efficiency, renewable energy, regional connectivity, and cross-border infrastructure and flow-management norms.

6.1. Policy Diffusion, Lessons Across Jurisdictions, and Path Dependency

The politics of renewable energy have been examined using several different methodologies. Comparative frameworks evaluate multiple jurisdictions simultaneously and rely on a common analytic scheme. Such approaches often look for evidence of policy diffusion in the form of the spread of similar instruments, targets, or strategies across space and time. Policy diffusion requires consideration of both supply and demand sides, and the sources of policy ideas can be divided into those arising from agency and those associated with ideas. Agency factors relate to the equality of national borders in regions with significant differences in political importance. Idea factors include attractiveness and feasibility. Actors (such as interest groups) that desire policy change usually look to and copy other jurisdictions with the best-performing policies. The "likelihood of copy" of these best-performing policies by actors must also occur in other jurisdictions; otherwise, it remains a unilateral diffusion of information.

Lessons tend to be drawn from large-scale infrastructure, such as energy supply. Governments have special reason to pay attention to the configuration of the public-private governance mix in such sectors. Nevertheless, there is no

uniform solution, entirely in the public or private sector, for the provision of such services. Energy security and the desire for energy independence have led governments to reflect carefully upon and invest public capital towards strategic industries. Some governments have relied on generous subsidies and tax breaks to spur the move toward renewable energy. Others have employed more direct means (feed-in tariffs, for example) to induce private-sector operators to invest. These means have examined both the direction of investment and the "technology" in which such investment takes place.

6.2. Reliability, Grid Modernisation, and Energy Security

Reliability, Grid Modernisation, and Energy Security

Investment in renewable energy sourcing and grid modernisation is imperative due to the increasing share of electricity from variable generation. The need to ensure minute-to-minute balancing increases the volume of necessary intra-day trading. Reliability is also threatened where access to the electricity supply remains limited, leading to greater reliance on intermittently available generation. A multitude of metrics constitute the broad concept of reliability, each addressing different dimensions such as outage duration, failure rate, and other aspects relevant to local circumstances (Andreas Coester et al., 2018).

Climate change commitments frequently engage the global energy community. However, accountabilities often remain vague, and uncertain metrics enable adjudication of pledges. Many countries proclaim adherence to the Paris Agreement, yet scepticism persists about the effectiveness of the actions taken. Progress on a commitment remains notoriously difficult to assess when no reporting framework exists. Overall, leaving unclear how each actor intends to reduce CO2 emissions constitutes an imperative omission (Orhun Altiparmak, 2022).

6.3. Climate Commitments, Transparency, and Accountability

Environmental commitments are the cornerstone of global climate governance. Since the 1990s, various international agreements have recognised the need to address climate change, and the 2015 Paris Agreement initiated a global review cycle to identify climate rhetoric as a driver for climate protection. In 2022, a significant portion of the planet's population was protected by Nationally Determined Climate Commitments across developing and advanced economies. The Kyoto Protocol exemplified how one country's political decision could change the compliance

dynamics of the correct regime, with significant implications for other countries and the regime itself (Schmitz, 2016). Academic research on the interdependence of NDCs across countries has also increased.

Monitoring, reporting, and verifying pledges, reducing ambiguity, and lowering transaction costs are crucial for enhancing the credibility of climate commitments. Routers and transmitters also exhibit responsibility or validity. With rising cross-national interconnectivity, the credibility of climate rhetoric in one country is often perceived collectively in both developed and developing nations. Emission trends are increasingly observed, either explicitly or implicitly, in developing states; new active players accumulate historical responsibility and the need for a proper fabric, e.g., the tentative detection on the brink of a characteristic curve.

7. Methodologies for Analysing Renewable Energy Politics

The politics of renewable energy can be examined using comparative frameworks and indicators or through case studies. When employing a comparative approach, three foundational questions can guide the analysis: which renewable energy sources receive policy support; which policy instruments promote those sources; and how strong the overall support regime is, based on the types and number of instruments implemented. These questions can be quantified using publicly available data; in particular, the International Renewable Energy Agency (IRENA) and the Organisation for Economic Co-operation and Development (OECD) compile statistics on the role and cost of renewable energy by country. At the same time, the World Bank provides detailed indicators on regulatory and market frameworks for doing business. This comparative framework facilitates cross-national analyses that can lead to broader conclusions about political interactions and power dynamics (Eadson & Foden, 2019).

Similarly, a case study/longitudinal design can be employed to track state-market interactions and their implications for supply chains in select jurisdictions. The analytic emphasis being examined influences case selection. If the emphasis is on market engagement, relevant cases may arise from countries like China, Germany, the Netherlands, and the US, which have governments that intervene forcefully in certain markets but otherwise lack coherent policies (including economic or industrial ones). To further the exploration of public and private actors, whether through state-led

financing or private-sector investment, complementary cases of different sizes and wealth levels, e.g., Kenya and China, Germany, the Netherlands, or the US. Whichever cases are selected, the best opportunities for triangulation arise when the same data can be captured across the jurisdictions involved, and the data quality is generally high. Consequently, Germany is likely to be one of the strong candidates for inclusion in any such arrangement, as a rich set of materials is available and detailed studies examine political specifics from multiple angles (Lichtenstein, 2017).

All these approaches have their particular limitations and potential biases, in particular, the risk of misinterpreting the interaction as one fundamentally between states, as well as overemphasising dynamics that differ greatly in range and intensity between states. Simultaneous and interactive transitions, led by the state and driven by demand, can occur in various ways that involve the private sector. That attention to these interconnected relationships is crucial and has yet to be largely explored. Significant ethical issues arise regarding the need for responsibility and transparency in our research. This is especially the case given the cultural and temporal gap between the investigator and the case.

7.1. Comparative Frameworks and Indicators

The ability to scale up renewable energy deployment is influenced by state action, market activity, and global events. Policies implemented by the government would need a clarification of state-market relations (major focus in political economy) – Schmitz (2016). The combination of cases includes sovereign funding, market architecture, multinational corporations, international technology stocks, and asymmetrical dependencies on mineral inputs (M. Keppley, 2012). Up-to-date information includes all renewable energy deployment measures pertinent to any country. Emerging signs of international competition are ranking in fossil fuel usage and emissions intensity. Such facts provide critical information for promoting decarbonization in the domestic economy and generating renewable energy.

7.2. Case Study Approaches and Data Considerations

Limited interest has been shown in energy policy as a subject of analysis in policy studies, unlike many other policies. This analysis attempts to fill that gap and offer a systematically conceived framework for the political study of renewable-energy technologies and the policies that govern them. This involves

breaking down the technologies and their policy instruments into analytical units and identifying theoretical lenses. By developing dimensions along which these technologies and instruments vary widely and are theoretically relevant, an analytical framework is built that is suitable for comparative analysis in public policy and political economy (Eadson & Foden, 2019).

The present case study, in analytical depth, examines the politics of renewable energy in Chile and South Africa. A comparative analysis of these two countries is undertaken to gain insights into common challenges, opportunities, and strategies to achieve renewable-energy aims, drawing on information from semi-structured interviews with policymakers, marketplace actors, and stakeholders.

Given the vast number of policy domains and levels that together shape national renewable-energy trajectories, this comparative exploration examines the politics of renewable energy by deconstructing these technologies and interventions into mainstream and fringe options. The distinction between mainstream and fringe renewable energy technologies, together with the policies associated with each, facilitates formal analysis and comparative investigation.

7.3. Limitations and Ethical Considerations

Political attention for renewable energy is growing. It is considered an alternative that can literally reshape energy systems and sector governance along climate and sustainability lines. Renewable deployment is assumed to have clear net positive social and environmental implications. Surprisingly, this assumption is far from universally shared, revealing distributive and procedural concerns. One of the reasons for this research is that it presents an opportunity to inform such debates through a careful, systematic analysis of relevant events. The aim here is to re-analyse politics behind the renewable energy transition and see how different power dynamics, that are state, market and global, work in this space.

A lot of studies on the shift to renewable energy have expanded. Nonetheless, there is considerable theoretical and methodological variation across existing research, resulting in the emergence of various approaches that do not integrate across studies. Nonetheless, several studies have revealed that state, market, and global power dynamics are the focus of the overlapping forces at play and have noted similar national-level deployments. Such similarities have tremendous theoretical implications for the utilisation of renewable resources and

the power relations within energy sectors across spatiotemporal scales. Theoretical frameworks help to supplement the analysis of the empirical. They enable scrutiny of how the interaction between a resource type and broader structural forces shapes electricity governance, while indicating differences across renewable vs. nonrenewable resources, technology configurations, and the distinctive power structures that govern supply systems.

8. Conclusion

The study shows that the renewable energy policies of developed countries and emerging markets can either positively or negatively affect the success of renewable energy. An assessment of the electricity sector and the decarbonization of other parts of the economy shows that state characteristics, market forces, and geostrategic considerations can each be a game-changer, determining whether countries and regions succeed or fail to dig deep and scale fast in renewables. The political economy of renewable energy and the governance dynamics that shape its growing importance are complex and cannot be easily untangled.

As a result, the analysis presents a method that thoroughly breaks down the policies of renewables, along with the patterning of various empirical evidence. To begin, the energy market designs and industrial policy truly matter. In addition, domestic politics can also be significant. Public attitudes to renewables, the grouping of major publics and interests, and regional differences may affect the political bankability of an overall and lasting transition to a low-carbon economy.

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